Cold rolling mill

Cold rolling in many cases represents the final stage of the steel plant. During the cold rolling process, cooled hot rolled steel passes through another series of rollers at room temperature. Since the material is no longer hot and malleable, a significantly higher amount of pressure is required to compress it into the desired shape.

A virtual engineer, fully dedicated to the state-of-health of your installation: **InfraLytics®**

Motor health

Motors are essential for moving materials through the line. Failure or malfunctioning is best predicted well in advance. Combining a follow-up based on vibrations, temperatures and electrical currents the state-of-health of the motors can be tracked continuously, deviations detected in an early stage and unwanted standstills or serious damage prevented. Both DC, as well as AC motors, can be tracked.

Coupling health

Couplings are used to transfer the torque from the gearbox to the rolls themselves. They are subjected to the continuous torque of the rolling process but also are impacted by intense peaks due when material enters and exits the stand or in case of process deviations, certainly in the high-speed cold rolling process. A continuous follow-up of vibrations at high frequency allows detecting and quantifying the deviations, in turn leading to early detection of upcoming potential problems.

Gearbox health

In a rolling line, gearboxes are heavily loaded: high torque, high RPM and often multiple axes. Being in the center of the drivetrain and hard to service, detecting issues in an early stage is essential. In an ideal case process deviations that would eventually lead to the gearbox, degradation is detected in an early stage. Combining a follow-up based on accelerations as well as temperatures, both on the gearbox as well as the connected motors and axles provides a tool for optimal health-monitoring.

Bearing health

As for the couplings, the bearings in a rolling stand are subjected to the continuous torque of the rolling process, are loaded at high RPMs, but also are impacted by intense peaks when material enters and exits the stand or in case of process deviations. A continuous follow-up of vibrations at high frequency allows detecting and quantifying the deviations, in turn leading to early detection of upcoming potential problems.

Process deviations

In an ideal world, continuous rolling of material with homogeneous material properties results in the same signature in parameters such as vibrations, motor currents, torque... In reality, often deviations are observed. Automatic identification and quantification of these deviations allow tracking them in time using advanced correlation tools so the causes for deviations (the related components) can be identified and, ideally, remediated.

Roll health and surface integrity

Rolling results in high-frequency stresses being exerted on the rolls. These loads can have an enormous impact, structurally as well as on the roll surface. Lubrication, with a focus both, on product composition as well as flow rate, is used to further control the process. Tracking the behavior through vibrations in multiple axes, coupled with temperature, torque and/or motor current measurements as well as a close follow-up of the RPM and flow rate allows algorithms to be trained that allow in-situ identification of structural or surface-issues w.r.t. the rolls.

Tensioner system health

Well-controlled tensioning, de-coiling as well as coiling, together with a properly working buffer stand results in the smooth and continuous operation of the rolling line. Deviations in alignment or resonance effects can result in significant issues with material properties or even the integrity of the installation. Following the tension on the bolts in the bearing houses allows tracking stability, identifying non-uniformity and predicting structural issues in an early stage. As such long, safe and stable operations can be guaranteed.

Material quality issues

When all goes well, continuous rolling of material with specific material properties results in the same signature in parameters such as vibrations, motor currents, torque... When in seemingly identical runs the sensor values seem to deviate this can also be indicative for deviating material properties. Automatic identification and quantification of these deviations allow tracking them in time and provide relevant input for the process engineers. As such maximum product quality can be matched with optimal reliability of the installation.

Pinion health

Pinions are located in the chain transferring the torque from the motors to the rolls themselves. They are subjected to the continuous torque of the rolling process, and the associated high-speed rotations. A continuous follow-up of vibrations at high frequency allows detecting and quantifying the deviations, in turn leading to early detection of upcoming potential problems.

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